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ABSTRACT

This study identified courses associated with improvements in the writing skills of 455 first semester, freshman undergraduates at a large research university. Secondarily, faculty who taught these courses were interviewed to explore their teaching practices, course designs, and evaluation techniques. The same group of students was invited back for reassessment at the end of the freshman year (N=374) and at the end of the sophomore year (N=265). Students completed the writing assessment model from the Collegiate Assessment of Academic Proficiency each time. Student courses attended were linked with the results of the assessments to determine the change over time. Student result comparisons were made by class size and academic college. The most notable finding from the faculty interviews was that nearly one-half stated that writing was not a course goal, although most believed it should be an important part of the class and of the student's development; blame was placed on large class sizes. As for students, certain courses were found to be associated with gains in students' writing skills: foreign languages, music, philosophy, sociology, and communications. However, it was also found that, overall, students's writing skills declined during the freshmen year and never increased beyond their original level of writing skills. (NAV)

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Enhancing the Teaching & Learning Process of Undergraduate Education at Large Universities

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Assessments of student learning are valuable since they point the way toward more effective programs and ultimately, to improved student performance in college. Assessments must link student learning with their education experiences in order to facilitate improvements. Assessments of student learning in general education are particularly difficult to marshall in large, comprehensive universities or colleges where the curricula and academic programs are diverse. Such programs often consist of thousands of courses loosely organized into distributional plans of general education.

Many faculty and administrators are committed to quality improvement. They encourage the evaluation of institutional performance relative to student learning. The majority of the nation's postsecondary institutions report using some outcomes assessment activities to evaluate program quality and educational effectiveness (El-Khawas, 1989). However, the American Council on Education reported that only 30 percent of the nation's two-year and four-year colleges and universities operate comprehensive student assessment programs. An additional 60 percent reported that they planned to establish such programs in the future (ACE, 1991). At the same time, most institutions are attempting to reform general education (Gaff, 1992). Unfortunately, rarely have assessment initiatives and curricular reform efforts informed one another. While the evidence suggests that most colleges and universities are trying to improve student learning, the results of their efforts have yet to materialize (Astin, 1991; Eaton, 1991).

Problem Statement

In many institutions, general education and assessment go forward on separate paths, in different parts of the institution, often with responsibility for overseeing the activities given to

different committees with different interests (Hutchings, Marchese, & Wright, 1991). This is a major shortcoming of reform efforts that results from the lack of a clear way to tie student assessment and curriculum reform.

General education programs often have "no concrete goals or outcomes statements and students move through the program in who-knows-how-many permutations and configurations" (Hutchings, Marchese, & Wright, 1991, p. 6). Many institutions are dissatisfied with their assessment results and the methods used to gather and analyze information (American Council on Education, 1991).

American higher education needs improved student performance, stronger academic direction, and standards. Students enter college with a wide variety of backgrounds, life experiences, aptitudes, and educational achievements. The curricular sequence that is most motivating and is most appropriate to the student's educational abilities varies greatly from student to student. College or university administrators and faculty can better identify those sets and sequences of course that are most appropriate for students of a given ability level or interests.

Faculty and administrators need to make more substantive links between what students study in college and what they learn. Students who take different coursework learn different content knowledge, cognitive skills, values, and attitudes towards learning. Student learning varies greatly in complex institutions of higher education with broad arrays of curricular offerings. Approaches to search for the one best assessment of general education for students in large universities must recognize this curricular diversity and its effects. Thus, a challenge to the assessment of general education in these institutions is to determine the relationship

between coursework taken and learning achieved. Equally important is the identification of faculty and their classroom processes that seem to influence the development of undergraduates' skills and abilities.

In this present study, we identified the courses associated with improvements in the writing skills among undergraduates at a large research university. An important general education goal is to help students learn to communicate effectively. We also interviewed faculty who taught these courses to explore their teaching practices, course designs, and evaluation techniques. We wanted to determine how teaching practices influence student learning.

Framework

A literature review indicated that no single curricular model and no single analytical process clearly identified the effect of coursework patterns on the learning of undergraduates. Therefore, we used the cluster analytic model (developed by Ratcliff, 1987) to determine the effect of coursework. This model has proven valid and reliable within the context of a variety of higher education institutional types and student populations (Ratcliff, 1989). This model had been previously tested at six institutions: Stanford, Georgia, and Clayton State Universities, and Evergreen, Mills, and Ithaca Colleges. The model uses a conceptual, empirical approach. Student decisions about courses and actual selections guided the empirical search for coursework patterns associated with improvements in students' writing skills.

Student Sample and Assessment Instrument

In the Fall 1993 semester, we invited first semester freshmen to participate in this assessment initiative. Four hundred and fifty-five students initially participated. These

undergraduates were representative (i.e. by gender, ethnicity, majors, and ability) of the population of students enrolled at the main campus. The same group of students were invited for a second assessment at the end of their freshmen year and then for a third assessment at the end of the sophomore year. Three hundred and seventy-four undergraduates returned for the second testing and 265 returned for the final assessment. The undergraduate sample remained representative of the student population.

Each time, these students completed the same instruments including the writing assessment module from the Collegiate Assessment of Academic Proficiency (CAAP, published by the American College Testing Program). This module was designed to assess students' understanding of conventions of written English including punctuation, grammar, and sentence structure. Undergraduates were asked to evaluate the organization of ideas and relevance of statements in particular contexts. They examined the appropriateness of expression in relation to audience and purpose. They assessed the effective choice of statements of theme and purpose. They were asked to strengthen writing with appropriate supporting material. Undergraduates tested the precision and appropriateness in the choice of words and images, "rhetorically effective management of sentence elements, avoidance of ambiguous references and economy in writing" (ACT, 1994). This particular instrument was recommended by a group of senior faculty who taught general education courses.

Design and Data Analysis

The primary design to assess student learning was a longitudinal study consisting of three different assessment times with the same cohort of undergraduates taking the same writing modules. The initial step in the analysis was to determine student learning gains in

writing. The initial abilities of the new freshmen were controlled for by regressing their second set of assessment scores at the end of the freshmen year on their initial scores. Gains at the end of the sophomore year were determined by regressing the third set of scores on their initial scores.

We compiled all the courses each student completed and linked them with the assessment data. We determined the mean assessment score for all students enrolled in each course (provided that each course enrolled at least five students). We used a cluster analysis on these scores in reviewing student transcripts to determine coursework clusters that these students had in common. For example, if students who took History 101, Sociology 200, and Philosophy 201 had comparable scores in writing, then these courses would be grouped together on one cluster. In the next step, the mean of the clusters were computed for writing. This mean was used as the basis for the discriminant analysis to determine gains for particular groups of courses.

From these methods, we identified faculty who taught courses associated with gains in student learning. We interviewed these faculty and analyzed the results. We primarily used descriptive statistics to identify the proportion of faculty who responded in certain ways. We also used chi-square analysis to determine if differences existed in faculty responses according to the size of the classes they taught. Class size was split into three categories: small (30 students or less), medium (31-80 students), large (81-200), and extra large (over 200 students). We also analyzed the results by academic college to determine if there were differences according to faculty disciplines.

Results

Some undergraduates performed well on the writing module (see Table 1). For the pre-test (during the beginning of the freshmen year), students answered the questions correctly on approximately 59.05 of the 72 items.

Table 1.
The Distribution of Writing Scores for Three Assessment Times

CAAP Item-types	*Number of Items*	*Sample Mean*	*Standard Deviation*
Writing (1st)	72	59.0	9.42
Writing (2nd)	72	56.2	10.11
Writing (3rd)	72	59.1	9.58

Some students attained perfect writing scores. In the second assessment (at the end of the freshmen year), undergraduates showed some decline in writing skills overall as the students answered approximately 56.27 of the items correctly. There were no perfect writing scores. The final assessment (at the end of the sophomore year) revealed that students reached the levels that they scored as entering freshmen.

Regression Analysis of CAAP Post-Test Scores on CAAP Pre-Test Scores

According to Astin's model (1970a, 1970b), the effect of the learned abilities of students entering college on student outcome measures should first be determined. Once the variance in CAAP post-test scores attributable to the CAAP pre-test scores was determined, the unexplained variance (score residuals) could be used as a proxy of change in students' writing skills.

As Table 2 demonstrates, approximately 47 percent of the variance (adjusted R-Square) in the writing assessment of the CAAP at the end of the freshmen year was explained by the

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CAAP pre-test scores (from initial assessment at beginning of freshmen year) of students with regression functions statistically significant at .0001. The remaining variance not explained is the change in student ability plus an error term (i.e. luck, illness, test differences etc.).

Table 2 *Summary of Regression Analysis of CAAP Writing Item-type*			
Regression of CAAP		***Penn State Freshman Sample***	
Item-types	***Code***	***F Value***	***Adjusted R-Square***
Writing (End Year 1)	WR	339.818	0.4753
Writing (End Year 2)	WR	246.032	0.4814
$p > F = .0001$			

The regression analysis of the results from the assessment at the end of the sophomore year on the pre-test indicated that 48 percent variation was accounted for in writing.

Using the student residuals obtained from the regression analyses above, the mean residuals for each course enrolling five or more students was calculated for the writing CAAP item-type. Such a procedure does not assume that the specific gains of the students enrolled in each course were directly caused by that course. Rather, the residuals of each student are attributed to all the courses in which they enrolled, and the mean residuals for each course serve as a proxy measure of student gains. Once courses are clustered by these gains, then hypotheses can be generated and tested as to why students who enrolled in a given pattern of courses experienced significant gains on one or more of the outcomes criteria (i.e., the item-type residuals).

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Cluster Analyses

The quantitative cluster analytic procedures were used to identify the courses associated with gains in student learning. Secondary validation (discriminant analyses) of the Penn State sample suggested that the cluster analytic model was a valid and reliable means for determining coursework associated with the general learned abilities of undergraduates.

The objects of these analyses were the courses which constitute the enrollment patterns of students in the Penn State sample. The subject of the overall research was the coursework in which students enrolled, not the students themselves. The criterion variables in the research were the CAAP module residuals. The distribution of those residuals among the coursework is described below.

Reviewing Student Transcripts

There were 5,096 courses listed on the 375 transcripts of the students in the sample indicating that, on average, each of these students had enrolled in 13 courses during their freshmen year (Table 3). Surprisingly, some students felt they were prepared to enter junior and senior level classes in their freshmen year with 101 (two percent) courses recorded on the transcripts as upper division courses (numbers 300-499). Of the 101 upper division courses, 35 were numbered as advanced undergraduate courses (400-499). This is somewhat unusual as freshmen entering these level courses needed written permission from the head of the department sponsoring the course. With this noted exception, students in the sample took the majority of their courses (86.6 percent) at the freshmen level (00-199).

Table 3 *Distribution of Courses by Course Numbering*			
Course Level	***Frequency***	***Percent***	***Cumulative Percent***
000-099	2945	57.8	57.8
100-199	1468	28.8	86.6
200-299	582	11.4	98.0
300-399	66	1.3	99.3
400-499	35	0.7	100.0
TOTAL	5096	100.0	100.0

Table 4 reveals that the students in the sample enrolled in approximately the same number of credits during their first two semesters. On average, students took between six and seven courses in each of their first two semesters. The enrollment patterns were representative of traditional, full-time resident students.

Table 4 *Year and Semester of Enrollment*				
Year	***Semester***	***Frequency***	***Percent***	***Cumulative***
1994	Fall	2507	49.1	49.1
1995	Spring	2589	50.9	100.0

When we examined student transcripts at the end of the end of the sophomore year, similar patterns emerged. Sophomores had enrolled in 6,132 courses on the 265 transcripts indicating that, on average, these students had enrolled in 23 courses during their first two years of school (see Table 5). Of the 6,132 courses, 435 (7.1 percent) were upper division courses and 174 of the upper divisions courses were listed as advanced undergraduate courses.

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Table 5 *Distribution of Courses by Course Numbering*			
Course Level	***Frequency***	***Percent***	***Cumulative Percent***
000-099	2748	44.8	44.8
100-199	1522	24.8	69.6
200-299	1427	23.3	92.9
300-399	261	4.3	97.2
400-499	171	2.8	100.0
Graduate	3	0.0	100.0
TOTAL	6132	100.0	100.0

Table 6 lists the courses taken by semester for the first two years of college. Students enrolled in a similar number of credits with students taking approximately six courses in each semester.

Table 6 *Year and Semester of Enrollment*				
Year	***Semester***	***Frequency***	***Percent***	***Cumulative***
1993	Fall	1468	23.9	23.9
1994	Spring	1538	25.2	49.1
1994	Summer	39	0.6	49.7
1994	Fall	1523	24.8	74.5
1995	Spring	1564	25.5	100.0

Cluster Analysis Results

Courses were classified into 13 coursework patterns according to a hierarchical cluster structure. Cluster analyses using smaller and larger numbers of cluster groupings provided comparably high levels of correct classification, as determined by subsequent discriminant analyses.

The discriminant analysis of the Penn State Freshmen Sample provided secondary validation that 89.39 percent of the course classifications were correctly predicted by the cluster

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analysis. The discriminant analysis is a secondary validation, since it is based on the same sample of transcripts and test scores.

Stated simply, 9 of 10 courses most frequently taken by the Penn State Freshmen cohort students were correctly classified according to their mean residual CAAP scores. While the cluster analysis produces coursework patterns according to criteria of general student learning, additional steps are needed: (1) to determine which courses were correctly classified and; (2) to ascertain which item-type (i.e. critical thinking, writing) scores contributed to any given coursework pattern. We identified courses which were incorrectly classified and subsequently dropped these courses from the analysis.

To compute the contribution of each mean item-type residual score to the discriminant functions, the correlation coefficients between mean residual scores and discriminant functions were examined. The correlations established the relationships between the discriminant functions and the CAAP item-types. Each discriminant function explains a certain proportion of the variation in the residual scores. For this project, it was decided that any function that explained less than five percent of the variation would not provide useful and reliable information and would not be included in the remainder of the analysis. Each of the four functions accounted for more than the five percent minimum and all were kept in the analysis.

Table 7 shows the courses that were associated with gains in students' abilities. The courses are arranged alphabetically with no weight given to courses appearing first in the list. Since two separate analyses were conducted, we note in the column 'Year' whether a course was associated with gains in the freshmen year (marked F) or with the sophomore year (marked S).

Those courses that contributed to gains in both analyses are marked with an 'FS'. These courses had high means for writing. While there are a variety of courses evident, there are a high number of language courses, including French, German, and Spanish as well as the speaking/writing general education courses of English 030 and Speech Communication 100B. These courses were associated with improvements in students' writing skills.

Table 7
Courses with High Means for Writing

Course	*Title*	*GE Code*	*Year*
AE 210	INTRO: ARCHITECTURAL STRUCTURES		F
AED 303	VISUAL ARTS IN ELEMENTARY SCHOOL		S
ADM J111	INTRO: AMERICAN CRIMINAL JUSTICE		S
AG 150	BE A MASTER STUDENT!		FS
AIR 101L	AIR POWER I		F
AIR 102L	AIR POWER II		F
ANTH 001	INTRO: ANTHROPOLOGY	GS	S
ANTH 002	INTRO: ARCHAEOLOGY	GS	S
ANTH 045	CULTURAL ANTHROPOLOGY	GS	FS
ARCH 111	DESIGN & PLANNING THEORY II		F
ART 001	VISUAL ARTS & THE STUDIO: INTRO	GA	F
ARTH 100	INTRO TO ART	GA	S
ARTH 211	ANCIENT ARCHITECTURE	DA	F
ASTRO 001	ASTRONOMICAL UNIVERSE	GN	FS
ASTRO 010	ELEMENTARY ASTRONOMY	GN	S
ASTRO 011	ELEMENTARY ASTRONOMY LAB	GN	S
B LAW 243	LEGAL ENVIRONMENT OF BUSINESS		S
BI SC 002	GENETICS, ECOLOGY & EVOLUTION	GN	FS
BI SC 003	ENVIRONMENTAL SCIENCE	GN	F

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BIOL 041	PHYSIOLOGY	DN	F
BIOL 101	PRINCIPALS OF BIOLOGY I	DN	F
BIOL 102	PRINCIPALS OF BIOLOGY II	DN	F
BIOL 297H	SPECIAL TOPICS		F
CI 295	INTRO: FIELD EXPERIENCE FOR TEACHER PREPARATION		S
C LIT 001	MASTERS OF WEST LITERATURE	GH	S
C LIT 184	THE SHORT STORY	DH	FS
CHEM 011	INTRO: CHEMISTRY		S
CHEM	CHEMICAL PRINCIPALS		F
CHEM	EXPERIMENTAL CHEMISTRY		F
CHEM 034	ORGANIC CHEMISTRY		F
CHEM 389	SPECIAL PROBLEMS & RESEARCH		F
CLASS 045	CLASSICAL MYTHOLOGY	DH	F
CMLIT 108			S
CMPSC 10	ALGORITHMIC PROCESSES	GQ	F
CMPSC 12	INTERMEDIATE PROGRAMMING		F
CMPSC 20	BUSINESS PROGRAMMING APPLICATIONS	GQ	F
COMM	MASS MEDIA & SOCIETY	GS	F
COMM	CINEMA ART	GA	S
COMM	INTRO: ADVERTISING		S
E E 305	INTRO: ELECTRONIC MEASURING SYSTEMS		S
E G 003	ARCHITECTURAL GRAPHICS		F
E G 030	ELEMENTARY COMPUTER GRAPHICS		F
E MCH 012	DYNAMICS		S
E R M 200	ENVIRONMENTAL RESOURCE MGMT: ORIENT		S
EARTH 002	GAIA-EARTH SYSTEM	GN	F
ECON 002	MICROECONOMIC ANALYSES	GS	S
EDPSY014	LEARNING & INSTRUCTION		S
EDPSY101	STATISTICAL DATA	GQ	S

EDTHP 115	EDUCATION IN AMERICAN SOCIETY		S
ENGL 001	UNDERSTANDING LITERATURE	GH	F
ENGL 030	HONORS FRESH COMPOSITION	GWS	F
ENGL 100	ENGLISH LANGUAGE ANALYSIS		S
ENGR	INTRO: ENGINEERING		F
ESACT 031	BADMINTON I	GPE	S
ESACT 120	FENCING I	GPE	F
ESACT 280	SOCCER I	GPE	S
ESACT 342	TENNIS I	GPE	S
FR 003	INTERMEDIATE FRENCH		S
FR 201	ORAL COMMUNICATION & READING		FS
FR 202	GRAMMAR & COMPOSITION		S
GEOG 020	INTRO: HUMAN GEOGRAPHY	GS	S
GEOSC 020	PLANET EARTH	GN	FS
GER 001	ELEMENTARY GERMAN I		FS
GER 002	ELEMENTARY GERMAN II		FS
GER 003	INTERMEDIATE GERMAN		S
HIST 003	AMERICAN NATION: HISTORICAL PERSPECTIVES	GH	FS
HIST 010	NON-WESTERN CIVILIZATIONS	GH	S
HIST 021	AMERICAN CIVILIZATION FROM 1877	DH	FS
HL ED 045	ALCOHOL AWARENESS EDUCATION	GHS	S
HL ED 046	INTRO: HUMAN SEXUALITY	GHS	S
HL ED 057	CONSUMER HEALTH	GHS	FS
HL ED 126	ELEMENTARY SCHOOL HEALTH PROGRAM		S
HUMAN 00	SHAPING MODERN MIND	GH	S
KEYBD 10	PIANO SECONDARY	DA	S
L A 100	EFFECTIVE DECISION MAKING		S
LARCH 00	NATURAL & HISTORIC LANDSCAPE	GA	S
M E 030	ENGINEERING THERMODYNAMICS I		S

MATH 017	FINITE MATH	GQ	F
MATH 021	COLLEGE ALGEBRA I	GQ	S
MATH 022	COLLEGE ALGEBRA II	GQ	S
MATH 041	TRIGONOMETRY & ANALYTIC GEOMETRY	GQ	FS
MATH 110	TECHNIQUES OF CALCULUS I	GQ	FS
MATH 111	TECHNIQUES OF CALCULUS II	GQ	S
MATH 200	NUMBER SYSTEMS	GQ	S
MATH 231	CALCULUS OF SEVERAL VARIABLES		F
MATSC 10	ENERGY & FUELS IN SOCIETY	GN	F
METEO 00	WEATHER & SOCIETY	GN	S
MUSIC 005	INTRO: WESTERN MUSIC	GA	FS
MUSIC 009	INTRO: NON-WESTERN MUSIC		F
MUSIC 079	PEP BAND		S
MUSIC 081	MARCHING BLUE BAND	DA	FS
MUSIC 085	SINGING LIONS	DA	S
MUSIC 091	WOMEN'S CHORUS	DA	F
MUSIC 103	CONCERT CHOIR		F
NUTR 251	INTRO: PRINCIPALS OF NUTRITION	GHS	F
PHIL 001	BASIC PROBLEMS OF PHILOSOPHY	GH	S
PHIL 003	MORAL VALUE	GH	F
PHIL 010	CRITICAL THINKING & ARGUMENT	GH	S
PHIL 012	ELEMENTS OF SYMBOLIC LOGIC	GQ	FS
PHYS	GENERAL PHYSICS		F
PHYS 215	INTRO: PHYSICS	DN	S
PL SC 001	INTRO: AMERICAN NATIONAL GOVERNMENT	GS	FS
PSY 002H	PSYCHOLOGY		F
PSY 231	INDUSTRIAL PSYCHOLOGY	DS	S
STS 200	CRITICAL STS ISSUES	GS	FS
SOC 001	INTRO: SOCIOLOGY	GS	S

SOC 003	INTRO: SOCIAL PSYCHOLOGY	GS	F
SOC 012	CRIMINOLOGY	DS	FS
SOC 030	SOCIOLOGY OF THE FAMILY	GS	F
SPAN 001	ELEMENTARY SPANISH I		FS
SPAN 002	ELEMENTARY SPANISH II		FS
SPAN 003	INTERMEDIATE SPANISH		S
SPAN 100	INTERMEDIATE GRAMMAR & COMPOSITION		S
SPAN 200	INTENSIVE GRAMMAR & COMPOSITION		S
SPCOM	EFFECTIVE SPEECH	GWS	F
SPLED 400	INTRO EXCEPTIONAL CHILDREN		S
STAT 100	STATISTICAL CONCEPTS	GQ	S
STAT 200	ELEMENTARY STATISTICS	GQ	F
THEA	ART OF THEATRE	GA	F

GE (General Education) Codes
Skill Courses: GWS=Writing/Speaking; GQ=Quantification; GHS=Health Sciences; GPE=Physical Education
Breadth Courses: GN=Natural Sciences; GA=Arts; GH=Humanities; GS=Social & Behavioral Sciences
Depth Courses: DN=Natural Sciences; DA=Arts; DH=Humanities; DS=Social & Behavioral Sciences

Results of Faculty Interviews

We identified faculty who taught courses associated with improvements in undergraduates' writing skills. We interviewed these faculty about their own goals and teaching strategies. About 39.55 percent of the faculty indicated that writing was a goal of their course while about 45.9 percent stated that it was not. About 14.55 percent stated that helping improve students' writing skills was an indirect goal (see Figure 1.1).

In general, faculy had a clear idea if the instruction of writing skills was a course goal, if their courses helped improve writing skills, and which specific strategies they would

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recommend to strengthen students' writing skills. Faculty were also able to recommend specific courses and their titles which they believed would help enhance writing skills. In addition, the faculty responses tended to be detailed and comprehensive in nature.

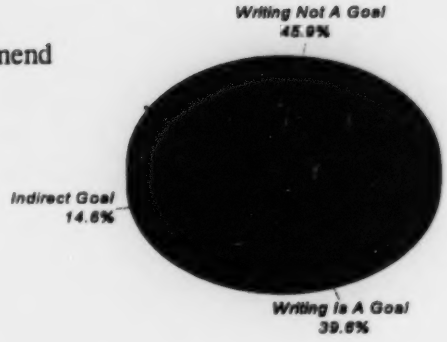

Figure 1.1. Distribution of Answers: Is it a goal of yours to help students improve their writing skills?

The most notable finding from the interviews was that nearly one-half of the faculty believed that writing was not a course goal. Faculty emphasized that increased class size limited their ability to effectively teach writing skills. These faculty viewed writing as an important goal but stressed that large class enrollments constrain the development and assignment of writing activities for students.

Faculty responses about writing goals differed by the size of classes they taught and by their affiliation with certain academic colleges. As class size decreases, faculty are more likely to report that improving writing is a course goal (see Table 8). However, as student enrollments increase, writing is less likely to be a goal. The clearest difference among academic colleges was evident between the two largest units in the College of Liberal Arts and the College of Sciences (see Table 9). Faculty who taught in liberal arts were more likely to

state that writing was a goal while faculty in the sciences were more likely to state that writing was *not* a goal.

Table 8
Writing as a Goal by Class Size

*FEP**	*Small*	*Medium*	*Large*	*XLarge*	*TOTAL*
No	22	24	39	38	123
	35.987	27.393	33.838	25.782	
	9.61	10.48	17.03	16.59	53.71
Yes	45	27	24	10	106
	31.013	23.607	29.162	22.218	
	19.65	11.79	10.48	4.37	46.29
TOTAL	67	51	63	48	229
	29.26	22.27	27.51	20.96	100.0

Chi Square DF=3, p < 0.0001
* Frequency; Expected; Percent

Table 9
Writing as a Goal by Academic College

*FEP**	*AA*	*AG*	*ED*	*EM*	*EN*	*HH*	*LA*	*SC*	*TOTAL*
No	13	2	4	9	9	13	19	49	118
	9.08	5.33	5.87	7.48	7.48	10.68	39.51	32.57	
	5.88	0.90	1.81	4.07	4.07	5.88	8.60	22.17	53.39
Yes	4	8	7	5	5	7	55	12	104
	7.92	4.66	5.13	6.52	6.52	9.32	34.49	28.43	
	1.81	3.62	3.17	2.26	2.26	3.17	24.89	4.53	52.53
TOTAL	17	10	11	14	14	20	74	61	198
	7.69	4.52	4.98	6.33	6.33	9.05	33.48	27.60	100.0

Chi Square DF=7, p < 0.0001
* FEP=Frequency; Expectancy; Percent

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The relationship between writing goals and class size was clear to the faculty. For example when asked if writing was a goal, a lecturer in meteorology answered flatly that "*the class is too big and I have no graduate assistant.*" A chemistry professor stated that teaching writing skills was a "*desirable goal, but impossible*" given the size of the course. A professor of physics stated that he would have liked to have writing as a course goal, but it would have been "*unrealistic with over 800 students.*" An instructor of health education believed that some of the university administrators must be aware of the fact that small classes enhance the learning environment because of its commitment to the scholar's program:

> *The university must believe that smaller classes make for better education because they have made that commitment to the Scholar's Program. Those same resources should be available to other students. Even the upper-level courses have more than 50 students in them. (graduate assistant, health education)*

The relationship between class size and teaching writing skills was important to the faculty throughout our interviews. Over one-third of the faculty stressed the size of classes must be reduced in order to help them improve student skills. Faculty felt that supportive activities such as discussion and group work were very difficult to implement in larger classes.

Some faculty members believed students lacked the necessary writing skills to participate in courses the research university. They blamed the lack of writing skills on larger societal factors such as educational values and the quality of primary and secondary schooling:

I hope that we as a society can prepare students better for their attendance at university. I can't believe how poorly prepared they are...The students weren't prepared to write. I found that almost no incoming students were able to write in any coherent way...and not all of the students were freshman. Overall, the writing was poor. The professor would put a lot of effort into reading the essays and giving feedback as well. (teaching assistant, geography)

Others blamed the teaching styles at the research university which overemphasize multiple choice examinations and allow students to avoid situations where they are expected to write:

The students seem to have had little experience with essay exams because they are used to multiple choice in the larger classes. (professor, Spanish)

Some faculty were critical and perceived that undergraduates' lack the necessary writing skills. These weaknesses were more readily apparent to those faculty who used a variety of written assignments in the classroom. These faculty were trying to build upon or enhance students' writing skills but found that they needed to provide some remediation types of work in order to get students to the appropriate level for their course. Other faculty were concerned that in large classes students are only assessed through multiple choice examinations. In these large sections, undergraduates have very few opportunities to write. Faculty perceived that a major portion of the undergraduate experience consisted of students enrolling in large classes.

Strategies and Recommendations for Improving Writings Skills

Faculty were also asked about how they believed their courses helped improve student writing skills. About two-thirds of the faculty who responded that their courses helped to strengthen writing skills mentioned different ways in which they believed that their courses helped. The five major approaches included: (1) teaching the writing process, (2) requiring writing assignments, (3) allowing for an optional paper or writing assignment, (4) using specific writing techniques, and (5) analyzing written work.

Faculty were also asked about what recommendations they would give to students seeking help with their writing skills. About 48 percent of the faculty recommended strategies of some kind which they believed improved students' writing skills. Some faculty only offered one piece of advice, while others recommended a variety of strategies. Faculty recommendations clustered into nine categories. Students could improve their writing by: (1) reading more, (2) writing more, (3) working one-on-one with the instructor, (4) learning to verbalize, (5) learning to self-edit or proofread, (6) using peer editing, (7) writing multiple drafts, (8) learning better organizational skills, and (9) starting their work early.

Faculty Course Recommendations

The faculty were asked which specific courses they would recommend students take to improve their writing skills. About 22 percent of the faculty did not offer a recommendation, stating that they had "no idea" which courses they would recommend. About four percent of the faculty stated that they would recommend individual faculty members rather than course titles. About 20 percent of the faculty recommended courses by their general characteristics

rather than by specific course titles. About 26 percent of these faculty recommended that students take "W" courses, which are specifically designated as writing intensive in their major. About 22 percent of the general recommendations were for unspecified "writing courses" such as "composition classes" or "technical writing courses". The remaining general characteristics were: (1) small courses, (2) courses that require a lot of reading, (3) courses that require a lot of writing, (3) English courses, (4) philosophy courses, and (5) foreign language courses. About 31 percent of the faculty recommended courses by their specific course titles. Over one-half of the recommendations were for required English courses.

Conclusion

Through a longitudinal study of undergraduates, we found that certain courses were associated with gains in students' writing skills. We also discovered that writing skills are not developed solely by the faculty in the English department. Courses in foreign languages, music, philosophy, sociology, and communications were found to be associated with improvements in writing skills. Despite these relationships, we found that overall undergraduates' writing skills declined during the freshmen year and never increased beyond the level of skills that they possessed as entering freshmen.

Interviews with faculty clearly demonstrate why undergraduates skills may not be developing over time as one might expect. Nearly one-half of the faculty stated that writing is not a course goal and they do not require any writing in their courses. Faculty emphasized that increased class enrollments severely limit their ability to effectively teach writing skills. These faculty viewed writing as important educational and course goals but stressed that large

classes constrain the development of classroom activities that are necessary to develop writing skills of undergraduates. In large classes, faculty tended to assess undergraduates through multiple choice mid-terms and final exams. At this research university, a major portion of undergraduates enroll in large classes. In smaller classes (30 students or less), faculty tended to report that writing was a course goal and they implemented writing assignments. Faculty expressed a desire to develop undergraduates' writing skills but also believed that they lacked the training to effectively try innovations particularly in large classes.

Undergraduates need multiple opportunities to continue to develop, practice, and refine their writing skills as they progress through their undergraduate education. At the research university, all undergraduates are required to take a writing course as part of their general education requirements as well as a writing intensive course in their major. While some courses have the explicit purpose to develop or strengthen writing skills, the key question is should writing goals be expected across the curriculum or should they be expected in only a few specific courses. Some institutions have implemented "writing across the curriculum" programs which carefully articulate how the majority of courses and the faculty expect to develop and assess students' writing skills.

Undergraduates at this research university do not have enough multiple opportunities to practice and refine their writing skills in different courses across the curriculum and within the disciplines. The faculty underscore the importance of developing writing skills. The challenge is to find ways to incorporate educational experiences across the curriculum that facilitate the development of undergraduates' skills. This is particularly difficult in large

universities. Innovative instructional practices that develop strong writing skills are critical if educators want students to be more effective communicators at work and in society.

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